

IFW



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF : Chang et al.

FOR : **A RECURSIVE LEAST SQUARES
APPROACH TO CALCULATE MOTION
PARAMETERS FOR A MOVING
CAMERA**

SERIAL NO. : 10 | 814, 711

FILED : March 31, 2003

EXAMINER :

ART UNIT :

CONFIRMATION NO. :

ATTORNEY DOCKET NO. : **SPAZ 2 00004**

INFORMATION DISCLOSURE STATEMENT

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 C.F.R. §§ 1.56, 1.97, 1.98 and MPEP § 609, applicant(s) submit(s) the following Disclosure Statement concerning art of which the applicant(s) is (are) aware. A copy of PTO-1449 is enclosed herewith.

This Information Disclosure Statement is not intended to constitute an admission that any patent, publication or other information referred to herein or submitted herewith is "prior art" for this invention unless specifically designated as such.

In accordance with the United States Patent and Trademark Office OG Notice dated 05 August 2003, waiving the requirement under 37 C.F.R. §1.98(a)(2)(i), for submitting a copy of each cited U.S. patent and U.S. patent application publication for all U.S. national patent applications filed after June 30, 2003, Applicant(s) has not

enclosed copies of the cited U.S. patents and applications with this Disclosure.

In accordance with 37 C.F.R. §1.97(g) and (h), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 C.F.R. §1.56(b) exists.

Under § 1.98(a)(3), no concise explanation of relevance is required for information that is in the English language. Accordingly, the enclosed require(s) no further explanation (or no translation is available).

Consideration of the appropriate paragraph(s) indicated below is respectfully requested:

☐ **WITHIN THREE MONTHS OF FILING:** Under § 1.97(b)(1), this Information Disclosure Statement is being filed within three months of the filing date of the application. Although it is believed no fee is necessary, any deficiency in fees should be charged to Deposit Account No. 06-0308.

☒ **BEFORE FIRST OFFICE ACTION:** Under § 1.97(b)(3), this Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits. Although it is believed no fee is necessary, any deficiency in fees should be charged to Deposit Account No. 06-0308.

☐ **INTERNATIONAL SEARCH REPORT:** Under § 1.97(e)(1), the undersigned certifies that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. Although it is believed no fee is necessary, any deficiency in fees should be charged to Deposit Account No. 06-0308.

☐ **BEFORE FINAL ACTION/WITH FEE:** Under § 1.97(c)(2), this information shall be considered if filed before the mailing date of a final action if accompanied by a fee in the amount of \$180.00 as required by §1.17(p). Accordingly, the necessary fee accompanies this Information Disclosure Statement. Any overpayment or deficiency can be charged to Deposit Account No. 06-0308.

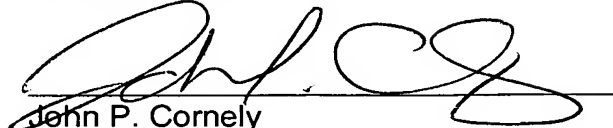
☐ **PRIORITY CLAIM:** The attached PTO 1449 Form includes all patents, publications, or other information previously cited by or submitted to the Office in one or more prior applications from which the present application claims priority. These one or more prior applications are identified in the papers accompanying the filing of this application. In accordance with § 609 MPEP, only copies of art not previously submitted are enclosed.

It is respectfully requested that the attached document(s) be considered and officially cited in examination of this application.

Respectfully submitted,

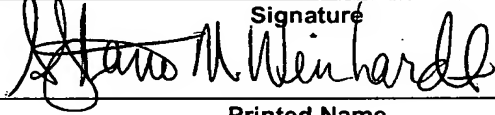
FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP

July 1, 2004
Date

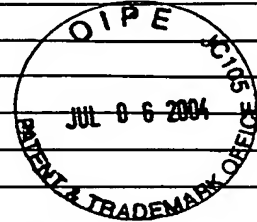

John P. Cornely
Reg. No. 41,687
1100 Superior Avenue
Seventh Floor
Cleveland, OH 44114-2518
216/861-5582

CERTIFICATE OF MAILING

I certify that this Information Disclosure Statement and accompanying document(s) are being
☒ deposited with the United States Postal Service as First Class mail under 37 C.F.R. 1.8, addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.
☐ transmitted to facsimile number _____ under 37 C.F.R. 1.8 on the date indicated below.
☐ deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated below and is addressed to: Mail Stop Amendment, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Express Mail Label No.:	Signature 
Date 7/1/04	Printed Name Stephanie M. Weinhardt

Substitute for form 1449/PTO		COMPLETE IF KNOWN	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT(S) <i>(Use as many sheets as necessary)</i>		Application Number	
		Filing Date	March 31, 2003
		First Named Inventor	Chang et al.
		Art Unit	
		Examiner Name	
Sheet 1 of 2	Attorney Docket No.	SPA2 2 00004	



U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.	Document No. Number-Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	AA	US-			
	AB	US-			
	AC	US-			
	AD	US-			
	AE	US-			
	AF	US-			
	AG	US-			
	AH	US-			
	AI	US-			
	AJ	US-			
	AK	US-			
	AL	US-			

FOREIGN PATENT DOCUMENTS

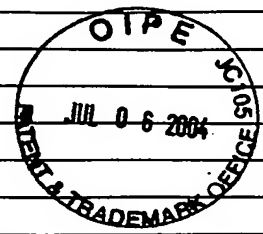
Examiner Initials*	Cite No.	Foreign Patent Document Country Code-Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
	AM					
	AN					
	AO					
	AP					

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume issue number(s), publisher, city and/or country where published	T
	AQ	J. Denzler, M. Zobel and H. Niemann, "On optimal camera parameter selection in Kalman filter based object tracking", Pattern Recognition, 24 th DAGM Symposium, Zurich, Switzerland, p. 17-25, 2002.	
	AR	D. Koller, G. Klinker, E. Rose, D. Breen, R. Whitaker and M. Tuceryan, "Automated camera calibration and 3D egomotion estimation for augmented reality applications".	
	AS	J.S. Goddard, M.A. Abidi, "Pose and motion estimation using dual quaternion-based extended Kalman filtering".	
	AT	C. Venter, B. Herbst, "Structure from motion estimation using a non-linear Kalman filter.	
	AU	T. Okuma, K. Sakaue, H. Takemura, N. Yokova, "Real-time camera parameter estimation from images for a mixed reality system", International Conference on Pattern Recognition (ICPR '00)- Volume 4, September 03-08, 2000, Barcelona, Spain.	
	AV	T.S. Huang, "Image sequence analysis", Spring-Verlag Berlin Heidelberg, 1981.	

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT(S) (Use as many sheets as necessary)		COMPLETE IF KNOWN	
		Application Number	
		Filing Date	March 31, 2003
		First Named Inventor	Chang et al.
		Art Unit	
		Examiner Name	
Sheet 2 of 2		Attorney Docket No.	SPAZ 2 00004



U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document No. Number-Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	BA	US-			
	BB	US-			
	BC	US-			
	BD	US-			
	BE	US-			
	BF	US-			
	BG	US-			
	BH	US-			
	BI	US-			
	BJ	US-			
	BK	US-			
	BL	US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		Country Code-Number Kind Code (if known)				
	BM					
	BN					
	BO					
	BP					

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volumeissue number(s), publisher, city and/or country where published		T
	BQ	S. Chang, "Rigid object motion parameter estimation from a dynamic image sequence", Ph.D. dissertation, George Mason University, Fairfax, VA, 1997.		
	BR	J.K. Cheng and T.S. Huang, "Image registration by matching relational structures, Pattern Recognition, 17 (1): 149-159, 1984.		
	BS	Z. Zhang, R. Deriche, O. Faugeras and Q.T. Luong, "A robust technique for matching two uncalibrated images through the recovery of the unknown epipolar geometry", INRIA research report, May, 1994.		
	BT	R. Tsai, "An efficient and accurate camera calibration technique for 3D machine vision", In proceedings CVPR '86, Miami Beach, Florida, pages 364-374, IEEE, June 1986.		
	BU	T.S. Huang and O.D. Faugeras, "A theory of self-calibration of a moving camera", The international Journal of Computer Vision, 1992.		
	BV	Q.T. Luong, O.D. Faugeras, "Self-calibration of a moving camera from point correspondences and fundamental matrices", International Journal of Computer Vision, 1, 5 40 (1).		

Examiner Signature		Date Considered	
--------------------	--	-----------------	--